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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/042,513	01/09/2002	Steven L. Edwards	2196-1 (FJ-99-4i)	9725

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EXAMINER

HUG, ERIC J

ART UNIT

PAPER NUMBER

1731

DATE MAILED: 08/28/2003

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary	Application No. 10/042,513	Applicant() EDWARDS ET AL.	
	Examiner Eric Hug	Art Unit 1731	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 09 January 2002 and 09 June 2003.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-205 is/are pending in the application.
- 4a) Of the above claim(s) 80-205 is/are withdrawn from consideration.
- 5) ☒ Claim(s) 16-79 is/are allowed.
- 6) ☒ Claim(s) 1-4, 11 and 13 is/are rejected.
- 7) ☒ Claim(s) 5-10, 12, 14 and 15 is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 09 January 2002 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
- 11) ☐ The proposed drawing correction filed on _____ is: a) ☐ approved b) ☐ disapproved by the Examiner.
If approved, corrected drawings are required in reply to this Office action.
- 12) ☐ The oath or declaration is objected to by the Examiner.

Priority under 35 U.S.C. §§ 119 and 120

- 13) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. _____.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
* See the attached detailed Office action for a list of the certified copies not received.
- 14) ☒ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. § 119(e) (to a provisional application).
a) ☐ The translation of the foreign language provisional application has been received.
- 15) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. §§ 120 and/or 121.

Attachment(s)

- | | |
|--|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413) Paper No(s). _____ |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | 5) <input type="checkbox"/> Notice of Informal Patent Application (PTO-152) |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO-1449) Paper No(s) _____ | 6) <input type="checkbox"/> Other: _____ |

DETAILED ACTION***Election/Restrictions***

Applicant's election of claims 1-79 on June 19, 2003 is acknowledged. Because applicant did not distinctly and specifically point out the supposed errors in the restriction requirement, the election has been treated as an election without traverse (MPEP § 818.03(a)).

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

1. Claims 1-4, 11, and 13 are rejected under 35 U.S.C. 103(a) as being unpatentable over Ilmarinen et al (US 5,495,678) and Ilmarinen (US 5,383,288) which is incorporated by reference into Ilmarinen et al '678. Ilmarinen et al '678 discloses a method for drying a paper web on a paper machine that includes the step of through-drying the web utilizing high velocity jets of air. Parameters governing the through-drying step are a velocity v of 20-60 meters/sec (given in column 8, lines 61-65), a pressure drop ΔP through the sheet of 1-4 kPa (column 12, lines 66-67). The air temperature is between 250-500°C (Ilmarinen '288, column 4, line 32). From this data, the following parameters can be obtained:

μ = viscosity of air @ $T=250-500^{\circ}\text{C}$

$G = \rho V = \Delta P / v$ (units of $\text{kg}/\text{m}^2\text{-sec}$) for range of pressures and velocity given above

Art Unit: 1731

The parameter G , used by Applicant is simply the pressure drop divided by the velocity. The Reynold's number is defined as $N_{Re} = \rho V D / \mu = G D / \mu$, where G is defined above and D is a characteristic hydraulic diameter of the pores in the sheet. The throughdrying coefficient, ω , has been defined by Applicant as being $2 + 2 / N_{Re}$.

Utilizing combinations of the above values of ΔP and v , an estimated viscosity μ of 1.8×10^{-5} kg/m-s, and an estimate for the hydraulic diameter D of 3×10^{-7} m, (equivalent to 1×10^{-6} ft disclosed by Applicant for prior art papers) the following values for N_{Re} and ω were calculated:

	ΔP (kPa)	v (m/s)	G (kg/m ² -s)	N_{Re}	ω
a)	1	20	50	0.842	4.38
b)	1	60	16.7	0.281	9.13
c)	4	20	200	3.36	2.60
d)	4	60	66.7	1.12	3.78

As seen above for the lowest pressure drop of 1 kPa, the calculated Reynold's number and subsequent throughdrying coefficient falls within the claimed ranges. At the higher pressure drop of 4 kPa and highest velocity of 60 m/s, the Reynold's number falls close to 1.0.

It would be reasonable to expect that a non-tissue paper as disclosed by Ilmarinen would have a smaller pore size than tissue paper, thus it would also be reasonable to expect that the hydraulic diameter would be below 1×10^{-6} ft. This would in effect lower the Reynold's number. For example, reducing the hydraulic diameter by a factor of 4 would bring the Reynold's number in calculation c) to a value of 0.281. Therefore, Ilmarinen teaches through-

Art Unit: 1731

drying conditions that could clearly read on the claimed Reynold's number and through drying coefficient, depending on the type of paper produced.

With respect to claims 11 and 13, at the time of the invention, it would have been obvious to one skilled in the art that recycled fibers are routinely used in a paper making machine via the return of broke to the stock blending process.

Allowable Subject Matter

Claims 16-79 are allowed.

Claims 5-10, 12, 14, and 15 are objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims.

The following is a statement of reasons for the indication of allowable subject matter:

Claims 5-10 are allowable for additionally specifying the relationship between the void volume fraction and hydraulic radius.

Claim 12, 14, and 15 are allowable for the additional feature of using recycled fiber greater than 50% or using non-cellulose fibers.

Claims 16-79 are allowed because the claimed features of Reynold's number and throughdrying coefficient are not disclosed in the prior art with respect to a wet crepe throughdry process for making a sheet or with respect to a method of making an absorbent sheet having the steps of forming, dewatering, drying on a Yankee dryer, creping, re-wetting, wet molding, and throughdrying.

Art Unit: 1731

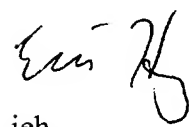
The prior art made of record and not relied upon is considered pertinent to applicant's disclosure.


Oubridge et al (US 4,462,868). Oubridge discloses a through-drying system for a paper web. Parameters governing the through-drying step are a velocity v of 1524 meters/min or equivalently 25.4 meters/sec (outlet velocity), an air flow rate through the sheet of 255,000 ft³/min, and an air temperature between 204-371°C (see column 4, line 51 to column 5, line 2).

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Eric Hug whose telephone number is 703 308-1980. The examiner can normally be reached on Monday through Friday, 9:00 AM to 6:00 PM.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Steven Griffin can be reached on 703 308-1164. The fax phone number for the organization where this application or proceeding is assigned is (703) 872-9306.

Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the receptionist whose telephone number is 703 308-0651.


jeh


STEVEN P. GRIFFIN
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